



X-59 Quiet Supersonic Technology X-Plane Accelerating Commercial Travel into the Future

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Birth of the Skunk Works® - June 17, 1943

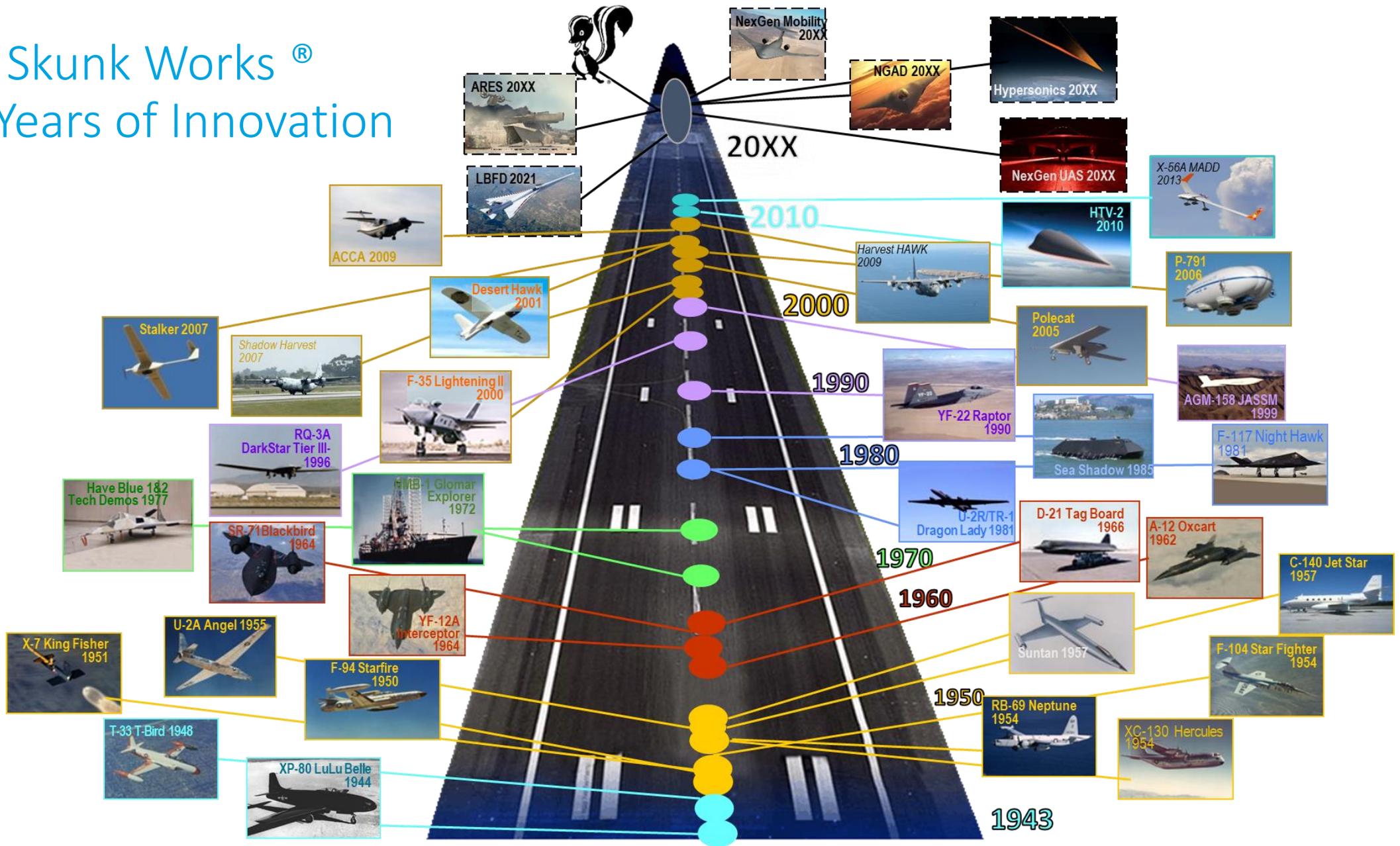


Top Secret XP-80 Design

**The Objective:
Immediate Development and Delivery of Jet
Fighters to Europe to Counter German Jets
Attacking Allied
Bomber Formations**

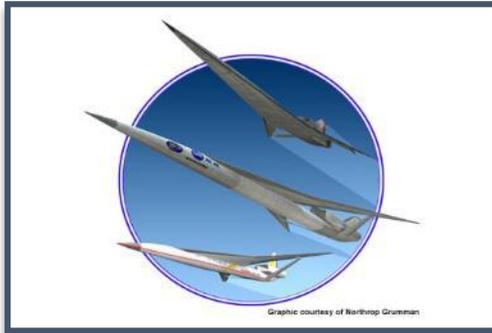


Skunk Works® 75 Years of Innovation



Low Boom History and Future

Quiet Supersonic Platform
2000



Quiet Supersonic Transport
2001-2003



F-5E Shaped Sonic Boom
Demonstration
2003



X-59 Low Boom Flight
Demonstration
2013-2022



FAR 91.817 -- "No person may operate a civil aircraft . . . at a ... flight Mach number greater than 1 . . . unless - {App. B} . . . the flight will not cause a measurable sonic boom overpressure to reach the surface . . ."



NASA Strategic Implementation Plan

Three Mega-Drivers

Six Strategic Thrusts



Strategic Thrust 1: Safe, Efficient Growth in Global Operations

Strategic Thrust 2: Innovation in Commercial Supersonic Aircraft

Strategic Thrust 3: Ultra-Efficient Commercial Vehicles

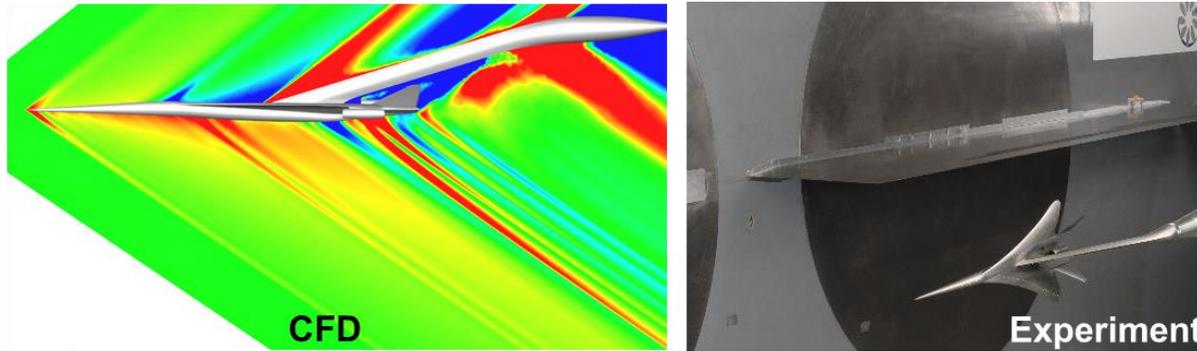
Strategic Thrust 4: Transition to Alternative Propulsion and Energy

Strategic Thrust 5: Real Time System-Wide Safety Assurance

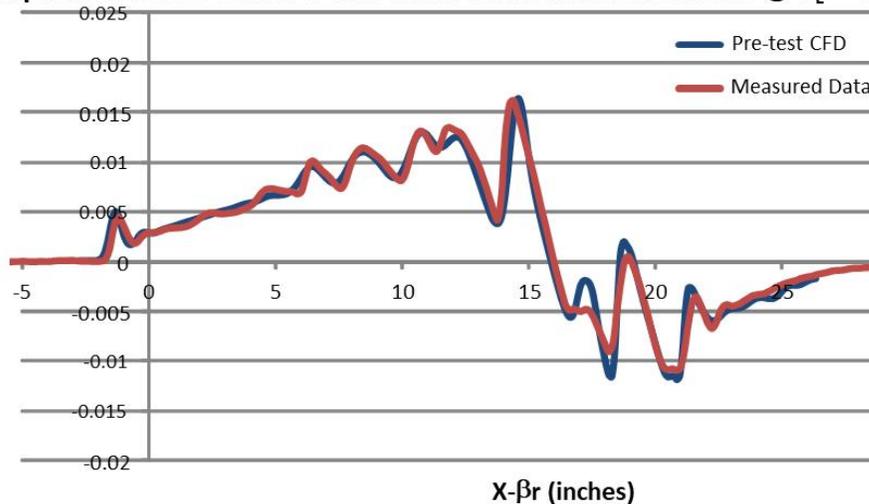
Strategic Thrust 6: Assured Autonomy for Aviation Transformation



X-59 – Why Now?



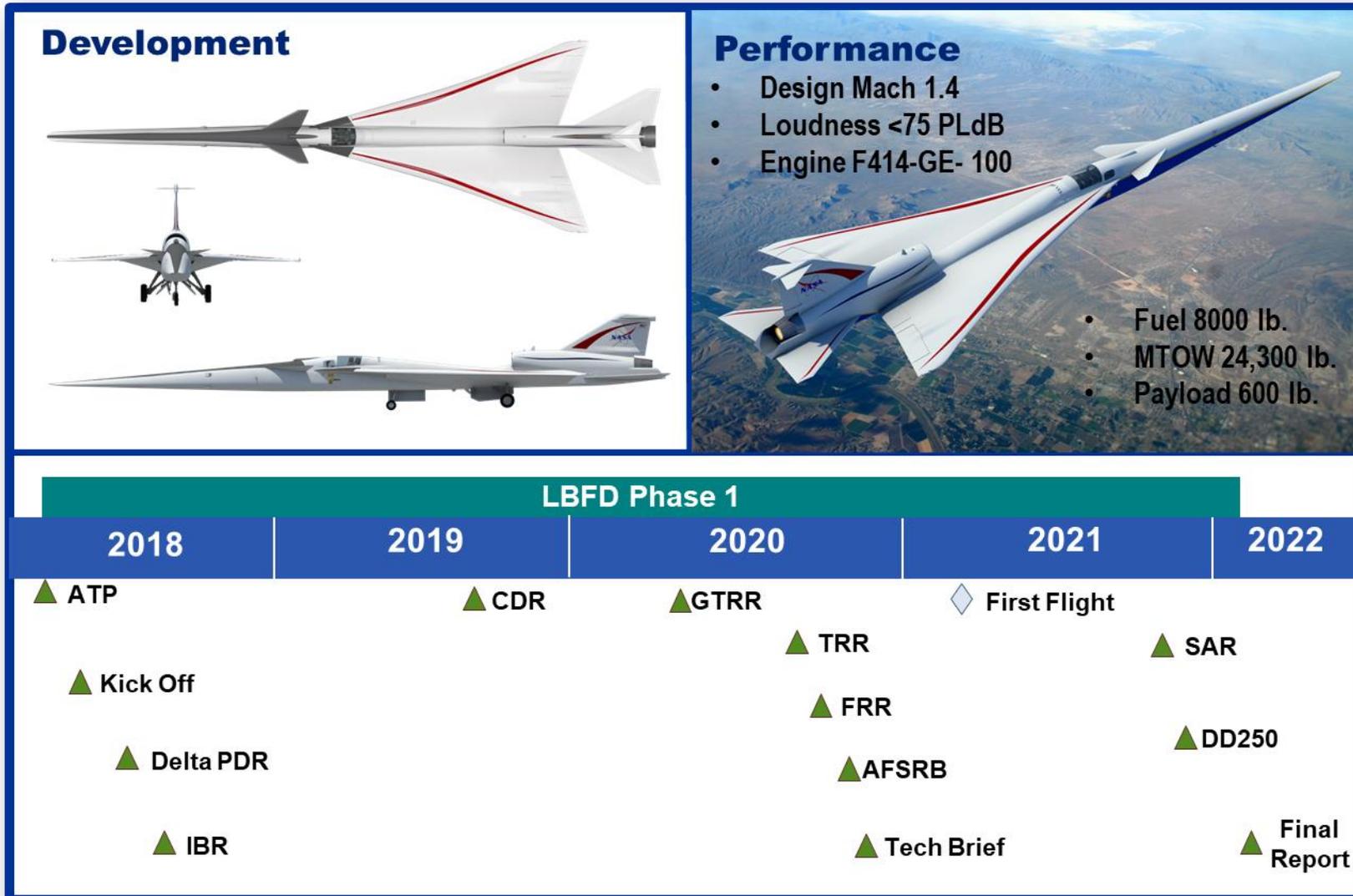
Comparison of Pre-test CFD and Wind Tunnel Measurements @ $C_L = 0.142$



Modern Design Tools
Are Ready for
Shaped Boom Design

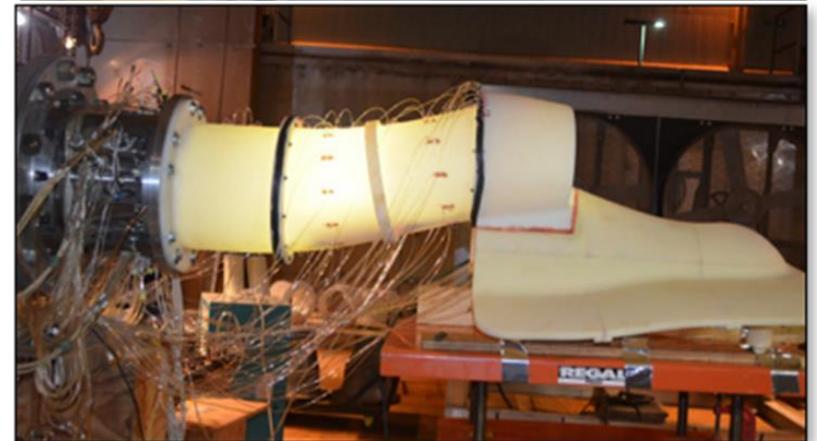
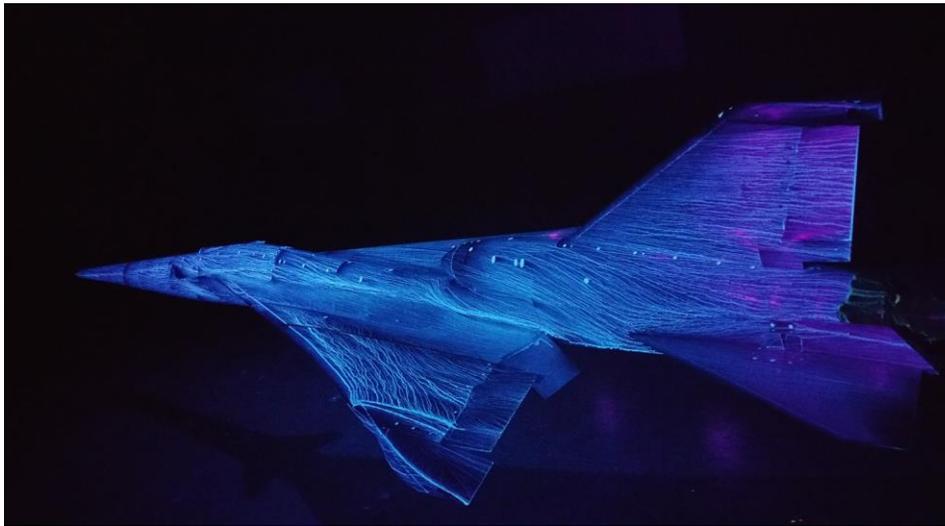


Focusing on Performance and Execution



Design Maturation

- Low speed wind tunnel – low speed stability and control predictions validation
- Static inlet test – static and low speed inlet performance validation
- Cockpit mock-up fabrication

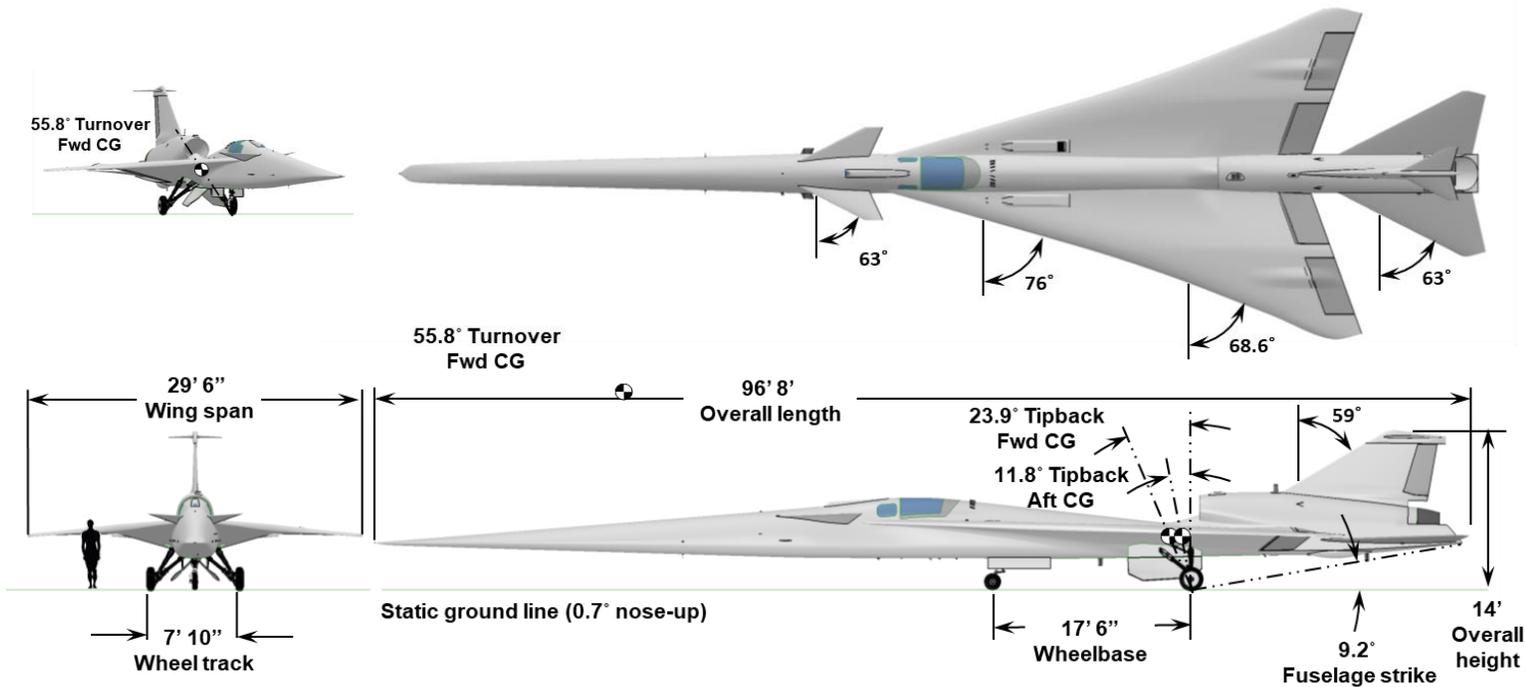


Reducing Risk Through Test Before Detailed Design



Design Maturation

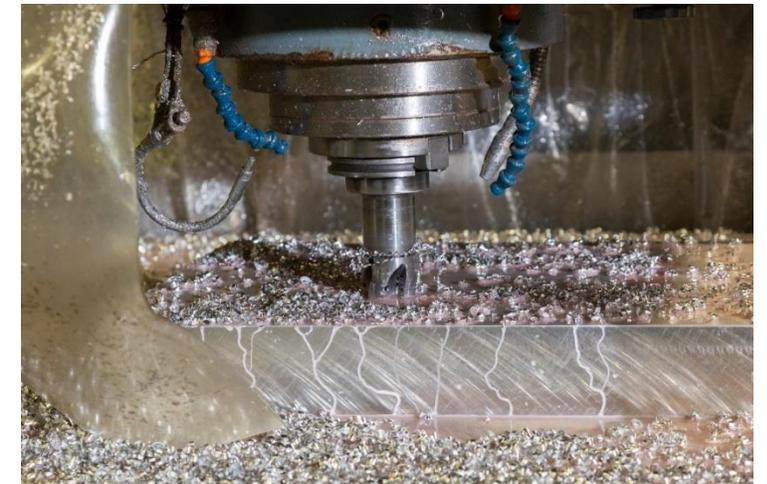
- Subsystem integration
- Control law development
- High speed wind tunnel – aerodynamic and inlet performance validation



Configuration C612	
MDGW	24,300 lbs
Design Mach	1.4
Loudness	<75 PLdB
Engine	1xF414-GE-100
Landing Gear	F-16 B1k25 NLG F-16 B1k25 MLG



First Chip Ceremony – Nov. 13, 2018



Bringing the Possibility of Supersonic Commercial Travel Closer to Reality

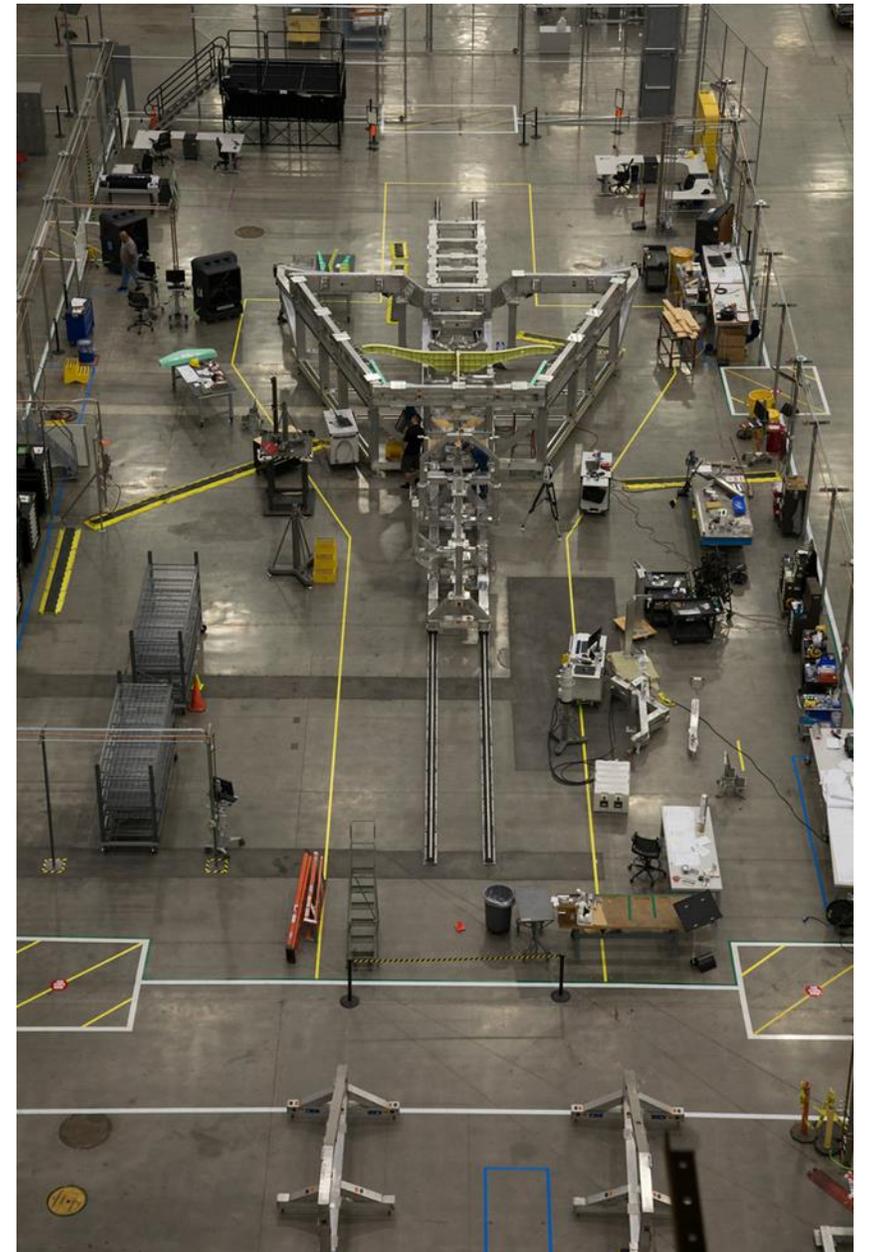


Current Activities

- Tooling fabrication nearing completion
- Engineering drawing release ramping up
- Supplier parts machining
- Subsystem procurements
- Subassembly procurements
- First major part jig load complete



June 2019





LOCKHEED MARTIN

